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ABSTRACT

This study sought to assess the effects of psychological warm-up on the verbal creative thinking abilities of first-grade children. The subjects were 96 black first-grade children enrolled in two schools in Athens and Atlanta, Georgia. Both schools are located in poor neighborhoods. Children were randomly assigned to control, physical warm-up, and physical and verbal warm-up groups. Multivariate analyses of variances yielded no significant differences among the groups for verbal fluency, verbal flexibility, and verbal originality scores. The standard administration procedures of the Torrance tests were as effective as psychological warm-up in facilitating creativity test performance. Since the creativity tests have been criticized for their test-like atmosphere, the present findings and earlier studies would appear to counter the hypothesis that a game-like assessment context is necessary to facilitate test performance and/or to obtain "true" test measures of creative thinking abilities. A recent reappraisal of research evidence suggests that the discordant results may have been the result of several erroneous assumptions, particularly as they relate to the presumed creativity-intelligence distinction. (Author/JM)

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EFFECTS OF ASSESSMENT CONTEXTS ON THE CREATIVITY TEST PERFORMANCE OF BLACK CHILDREN

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Effects of Assessment Contexts on the Creativity Test Performance of Blackchildren

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Despite its methodological shortcomings (Cronbach, 1968; Guilford, 1972) the publication of Wallach and Kogan's Modes of Thinking in Young Children stimulated a ~~number~~ number of studies of the role of assessment contexts in the measurement of creative thinking abilities. The basic premise was simple. If the assessment context provided for a warm, permissive, game-like atmosphere, a creativity dimension defined by high inter-test correlations and separate from an intelligence dimension would emerge. Thus, Wallach and Kogan (1965) concluded that a serious limitation of attempts to measure creative thinking abilities was the employment of administrative procedures such as time limits, a test atmosphere and other stresses. Using a play-like atmosphere and no time limits Wallach and Kogan found that creativity, defined as the ability to produce many associates and many that are unique, was independent of intelligence as assessed by traditional methods. Furthermore, it was implied that the game-like assessment contest would enhance performance and result in a more valid assessment of creative thinking abilities.

Following this lead Boersma and O'Bryan (1968) argued that a unified dimension of creativity separate from intelligence would emerge in a testing situation relatively free from the coercion of time limits and knowledge that behavior was being evaluated. It was also hypothesized

that the "game-like" assessment context would result in an increased level of creativity test performance and it was further expected that the relationship between intelligence and creativity would decrease under this condition. Forty-six Canadian boys were randomly assigned either to a standard (classroom) test administration or a "game-like" condition consisting of unrestrictive play with sports equipment, a visit to a swimming pool, and opportunities to play with toys. Subsequently, boys assigned to the "game-like" condition were tested and scored significantly higher on two Torrance tests, Figure Completion, and Unusual Uses. Moreover, inspection of the correlation coefficients between measures of intelligence and creativity revealed that the relationships between these measures were markedly reduced in the experimental condition. Consistent replication of such findings, however, have not always been reported.

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In Sherwood's dissertation (1970) eighty sixth grade boys were equally divided between two assessment contexts and administered Wallach-Kogan type tests. In the test-oriented condition the E referred to the tasks as tests, made references to timing, prominently displayed a stopwatch, and provided contextual remarks consistent with procedures associated with intelligence and achievement testing. In the other condition, the E introduced himself as a person interested in determining what games children were interested in, described the tests as games, avoided any mention of time pressure, and in general induced a relaxed atmosphere. Regardless of assessment contexts, the creativity measures were substantially intercorrelated and interdependent of the

scores obtained on a group intelligence test. Neither the restrictive nor the permissive assessment contexts effected ideational fluency.

In a highly related study, Kogan and Morgan (1969) contrasted a test-like and a game-like assessment context. The Ss were 104 fifth grade children. The former condition involved a presumed representative of the school superintendent who introduced Wallach-Kogan tasks as ability tests and prominently displayed a clock for timing. The latter situation presented a presumed representative of a toy company who introduced the tests as games. The predicted superiority of the game-like assessment context did not obtain; in fact, the test-like assessment context resulted in significantly higher performances in the case of the alternate uses test.

In general, studies of assessment contexts have paralleled the equivocal findings above and have been researched with respect to time limits (Torrance, 1969; Khatena, 1971; Feldhusen et al., 1971; Van Mondfrans et al., 1971), music (Norton, 1970; Hooper & Powell, 1971), evaluation set (Edwards, 1970; Warren and Luria, 1972), situational variables preceding testing (Elkind et al., 1970), cue-rich vs. cue-poor test environment (Mohan, 1970; Mohan & Gupta, 1972) and game-like, relaxed, etcetera vs. standard administration (Wallach & Kogan, 1965; Boersma & O'Bryan, 1968; Aliotti, 1969; Kogan & Morgan, 1969; Feldhusen et al., 1971; Van Mondfrans et al., 1971). Table 1 summarizes the results of these and similar studies of assessment contexts. A review of such studies is available in Wallach (1971) and Torrance (1972).

A second rationale for studying assessment contexts, and a more significant impetus to the present study, was developed from an increased

awareness in recent years of important issues in test measurement which are raised when various minority children are tested. Until such issues are resolved, inappropriate testing of these populations will likely result in social injustices involving denial of educational opportunity, inappropriate placement, and the like. Thus, the development of appropriate assessment procedures for testing minority-poverty populations remains as an important testing issue. Field observations during the author's graduate training, for example, indicated that poor black children rarely asked questions to find out something, showed considerable difficulty in elaborating an idea, preferred the familiar, avoided new or difficult tasks, were afraid to dream, and the like. Moreover, confirming the observations of Taba and Elkins (1966) many of these children expressed awe and fear when confronted with creativity test booklets. Still other children quickly "ran out of gas" and complained that they were fatigued after completing two or three of the seven verbal creativity tasks.

In 1968 the author was enrolled in a graduate course concerned with learning problems of disadvantaged children and youth taught by Dr. E. Paul Torrance. In order to provide students with a meaningful laboratory experience, the course included a three-week creativity workshop conducted in a poor, black neighborhood. The emphasis of the workshop was the identification and development of creative talent. A description of the program is available elsewhere (Torrance & Torrance, 1972). In order to uncover the hidden verbal abilities of these children, three procedures were employed before any testing was conducted: 1) tests were not given until there had been time for the creative processes of the children to become warmed up, 2) time limits were not imposed, and 3) the examiners

offered to record the children's ideas. These procedures proved to be quite effective and the children were observed to be remarkably verbal in the testing situation. The workshop format seemed to free them and make them more open and receptive to this educational intervention. These findings take on even more significance when it is recalled that while disadvantaged children have performed rather well on figural tests of creative thinking ability (Goldman and Torrance, 1967), even in formal situations, their performance on the verbal measures has been quite poor. These findings are consonant with the considerable research findings which have documented the generally poor test performance of disadvantaged children on most verbal tasks as compared to their advantaged counterparts. The present study sought to assess the effects of psychological warm-up on the verbal creative thinking abilities of first grade children.

SUBJECTS

The Ss were 96 black first grade children (Males = 41, Females = 55) enrolled in two schools in Athens and Atlanta, Georgia. The mean age of the Ss was 6 years, 11 months. Both of these schools are located in poor neighborhoods, and the children are representative of a minority culture in the southern United States.

PROCEDURES

To study the efficacy of psychological warm-up, a posttest only control group design was employed. Ss were randomly assigned within sex to one of three treatment groups. On the first day Ss assigned to the control condition were individually administered Verbal Form B of the Torrance Tests of Creative Thinking (Asking Questions, Guessing Causes,

Guessing Consequences, Product Improvement, Unusual Uses, Unusual Questions, Just Suppose) by a team of examiners in accordance with the standard administration procedures described in the norms-technical manual. Ss assigned to the physical warm-up (group two) and physical and verbal warm-up conditions (group three) received identical forty minute physical warm-up consisting of magic demonstrations, creative movement to music (e.g., "Magic Net" technique, Torrance, 1969), and interpretative soul dancing to a record by Diana Ross and the Supremes. The following day the first physical warm-up group was tested while the second physical warm-up group received an additional forty minute warm-up session designed to encourage verbal associating, question-asking skills, making guesses, and interpreting visual and tactile stimuli. Finally, on the third day this group was tested. Each warm-up was concluded with a juice and cookie refreshment period.

RESULTS

To test the hypothesis of the effectiveness of psychological warm-up, a 2 x 3, fully crossed, two-way analysis of variance with treatment and sex as the independent variables was conducted. In addition, analyses of these variables were conducted for each school in which the study was conducted. The dependent variables consisted of the verbal fluency, flexibility, and originality scores for the total battery and each of the seven tasks which compose the verbal Torrance test. Since the data were

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Note: It would, of course, have been preferable to have tested all Ss immediately after the warm-up. However, since the verbal Torrance tests take a minimum of forty-five minutes to complete, the logistics of such an endeavor made this alternative highly prohibitive.

multivariate in form, a multivariate analysis of variance was computed. Table 2 reports the results of the combined verbal fluency, verbal flexibility, verbal originality scores for ninety-six black first grade children.

Insert Table 2 about here

Inspection of the likelihood ratio test statistic (chi-square) and the F ratio test statistic indicated that significant treatment, sex, or interaction effects did not obtain. Additionally, analysis by school did not indicate a different interpretation of the results. The experimental warm-up treatments were no more facilitative of test performance than the standard test administration. An inspection of the means and standard deviations for each school considered separately, however, suggests some moderation of the conclusiveness of these findings.

Table 3 reports the means and standard deviation for the verbal fluency, flexibility, and originality scores from the Torrance test for the Athens, Atlanta, and total school samples.

Insert Table 3 about here

A perusal of the means for each treatment, for example, indicated that in the Athens School the mean performance of Ss in the warm-up treatments did indeed surpass the performance of the control Ss. The results were particularly clear for the verbal fluency and verbal originality scores. The ordered means were 30.80, 39.64, and 43.95 for verbal fluency and 15.30, 24.21, & 22.07 for verbal originality for the standard administration, physical warm-up, and physical and verbal warm-up conditions, respectively. A similar trend obtained for the verbal

flexibility score although the differences among treatment means was small. There is a strong suggestion in the data that large within groups variability and small sample size precluded a rejection of the null hypothesis of no treatment effects.

DISCUSSION

The standard administration procedures of the Torrance tests were as effective as psychological warm-up in facilitating creativity test performance. Since the creativity tests have been criticized for their test-like atmosphere (Wallach & Kogan, 1965; Wallach, 1971), the present findings and earlier studies would appear to counter the hypothesis that a game-like assessment context is necessary to facilitate test performance and/or to obtain "true" (i.e., orthogonality with intelligence tests) test measures of creative thinking abilities. A recent reappraisal of research evidence suggests that such a hypothesis may not be tenable (Wallach, 1971). The discordant results may have been the result of several erroneous assumptions, particularly as they relate to the presumed creativity-intelligence distinction. Interestingly, Wallach & Kogan (1965) rejected conclusions from studies which had demonstrated low correlations between measures of divergent production and traditional measure of intelligence. Guilford & Hoepfner (1966), for example, reported an average correlation of .32 between forty-five divergent production (DP) tests and IQ, a finding consistent with earlier studies employing a full range of IQs in their research samples. Torrance (1968) reported that the median of 88 coefficients of correlation between measures of intelligence and verbal creativity was .21.

The saliency of investigation of assessment contexts on this premise is questionable. First, such research focuses interest on creativity test performance per se rather than the relationship between test performance and socially valued criteria of creativity. Research directed toward establishing the external criteria against which creativity test performance can be evaluated still remains a primary research need. Secondly, while the creative process is often characterized by periods of play and relaxation, it is even more typically characterized by deliberate and concerted efforts and rather high levels of mental energy. In developing creativity measures care must be taken to include essential attributes of what is known about the creative ~~percess~~ process. Covington (In press) has argued that creativity tests are often characterized by psychometric procedures which present artificial and contrived situations. For example, Covington has stated that the creative process "is usually characterized by intense personal involvement in one real problem, over a period of time, with an emphasis on ordering a problem, coordinating or managing one's effort, and attaining a solution" (Treffinger & Poggio, 1972, p. 255). Guilford (1971) has also warned against an over-investment in "divergent thinking" tasks in the development of conceptualizations of the creative process. Similarly, changes in test conditions, such as variations in working time, test instructions, administrative procedures, incomplete or partial sampling of tests, and the like reduce comparability among research findings. Thus, performance differences are often confounded and one is unable to determine if subject scores are attributable to such changes or to individual differences in the test itself.

Creativity researchers might better address such questions as alternative procedures for sampling creative behaviors than suggest that assessment contexts may make creativity tests more or less valid. The development of more adequate norms, for example, might be profitably explored. Some preliminary research (Torrance, 1965, 1971) suggests that creativity tests allow subjects to respond in terms of their own unique experiences and hence are less susceptible to the effects of schooling. Research directed toward developing adequate normative data of various ethnic, cultural, and geographic groups and the development of "profile" norms would help dispel the mystic of creative functioning and contribute to an expanded and more realistic view of giftedness.

Table 1

Summary of Experiments Involving Assessment Contexts in the Measurement of Creativity

Investigator	Grade Level	Nature of Treatment	Significant (.05) Differences
Aliotti (1969)	1st Disadv.	Standard vs. warm up day prior to testing	Torrance Verbal: not significant
Boersma & O'Bryan (1968)	4th Boys	Standard vs. relaxed	Relaxed: Torrance tests
Edwards (1970)	6th	Evaluated vs. non-evaluated	Evaluated: Higher scores on Wallach-Kogan tasks
Elkind et al. (1970)	5-12yr.	Interruption of interesting vs. uninteresting task before testing	Uninteresting: Wallach-Kogan tasks
Feldhusen et al. (1971)	5th 8th	Standard, incubation, take home, game-like	Standard: highest score on Torrance verbal
Hooper & Powell (1971)	1st 3rd	Absolute music vs. programmed music	Absolute music: Torrance tests
Khatena (1971)	10th 12th	Variation in time limits for response	Increased time for incubation, increased originality, Torrance tests
Kogan & Morgan (1969)	5th	Test-like vs. game-like (timed)	Game-like: higher fluency and unique responses, Wallach tests
Mohan (1970)	4th	Cue-rich and cue-poor testing room	Environment: helped high creatives more than low creatives
Mohan & Gupta (1972)	5th	Cue-rich and cue-poor environment	Environment: higher combined score, Torrance verbal
Nash (1971)	1st Disadv.	Warm-up immediately prior to testing	Torrance figural
Norton (1971)	6th	Music	No significant difference, Torrance tests

Table 1 continued

Sherwood (1968)	6th Boys	Test-oriented vs. relaxed	No significant effects, ideational fluency
Torrance (1969)	6th	Take home after timed administration	Take home more valid for teacher curiosity nominations, Torrance tests
Towell (1972)	4th	Untimed	No significant increment, Torrance tests
Van Mondfrans et al. (1971)	5th 8th	Standard, incubation, take home, game-like	Take home: scores that fit best concept of creativity as unitary factor orthogonal to IQ, Torrance tests
Vernon (1971)	8th	Standard vs. relaxed, informal, relatively untimed	Relaxed: higher scores Torrance, Wallach-Kogan tests
Ward (1969a)	Nurs.	Cue-poor vs. cue-rich environment	No significant environment effect, Wallach-Kogan tests, creatives profit more cue-rich
Ward (1969b)	7-8yr.	Succesive time periods	Increased uncommoness with time, Wallach-Kogan tests
Warren & Luria (1972)	5th 6th	Decreasing evaluational set	No significant effects

Table 2

Results of the Multivariate Analyses of Variance for First Grade Black Children on the Combined Verbal Fluency, Verbal Flexibility, and Verbal Originality Scores from the Torrance Tests of Creative Thinking

N = 96

Source of Variation	df		F-Ratio or Chi-square	
			F-Ratio	χ^2
Subtotals (Treatment and Sex)		15		9.14
Interaction (Treatment X Sex)*		6		
Main Effects (Treatment)		6		5.74
Main Effects (Sex)	3/88		.23	
Subtotals (School and Sex)		9		6.49
Interaction (School X Sex)	3/90		1.22	
Main Effects (School)	3/90		.80	
Main Effects (Sex)	3/90		.12	
Subtotals (Treatment and School)		15		15.07
Interaction (Treatment X School)		6		7.04
Main Effects (Treatment)		6		5.46
Main Effects (School)	3/88		.77	

*Unable to compute due to non-gramian matrix.

Note: All tests were nonsignificant ($p>.05$).

Table 3

Means and Standard Deviations for Verbal Fluency, Verbal Flexibility and Verbal Originality Scores on the Torrance Tests of Creativity Thinking by School and Treatment

		Verbal Fluency			Verbal Flexibility			Verbal Originality		
		Cont.	Phys.	Phys. Verb.	Cont.	Phys.	Phys. Verb.	Cont.	Phys.	Phys. Verb.
Atlanta N=58	N	23	16	19	23	16	19	23	16	19
	$\bar{X}$	47.8	40.2	40.1	20.5	19.2	19.3	23.8	24.8	23.9
	SD	25.7	23.8	14.0	9.2	8.8	5.2	17.3	17.9	13.0
Athens N=38	N	10	14	14	10	14	14	10	14	14
	$\bar{X}$	30.8	39.6	43.9	17.9	17.4	17.4	15.3	24.2	22.0
	SD	9.0	16.8	23.3	5.6	5.4	7.2	9.1	15.1	14.5

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